

Appln No. 10/072,807
Amdt date November 13, 2003
Reply to Office action of May 15, 2003

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) An apparatus for transferring at least one part to be deposited on an immobilised immobilized pallet, characterised in that it comprises comprising:
a transporter ⁽⁺⁴²⁾ equipped with a gripping device ⁽⁺⁵⁰⁾ and adapted to grasp the at least one part ⁽⁺³⁸⁾ on a distributor ⁽⁺⁴⁰⁾, displace it from the distributor and deposit it in a positioning tool; ⁽⁺⁵⁴⁾, and
a manipulator ⁽⁺⁶⁰⁾ equipped with a gripper ⁽⁺⁶²⁾ and adapted to grasp the at least one part in a precise position in the positioning tool ⁽⁺⁵⁴⁾, displace it from the positioning tool and deposit it in a precise position in a positioning receptacle ⁽⁺⁶⁴⁾ carried by the immobilized pallet ⁽⁺¹²⁾.

2. (Currently Amended) An apparatus as set forth in claim 1 characterised in that wherein the distributor ⁽⁺⁴⁰⁾ and the positioning tool ⁽⁺⁵⁴⁾ are disposed at adjacent first vertical levels, ^(N1, N2) while the positioning receptacle ⁽⁺⁶⁴⁾ carried by the immobilized pallet is disposed at a second vertical level ^(N3) below the first vertical level ^(N2) of the positioning tool ⁽⁺⁵⁴⁾.

3. (Currently Amended) An apparatus as set forth in claim 1 or 2 characterised in that wherein the transporter ⁽⁺⁴²⁾

Appln No. 10/072,807

Amdt date November 13, 2003

Reply to Office action of May 15, 2003

comprises a mechanism {22, 45, 44} involving having crossed movements, which is adapted to provide pilot-control of a carriage {46} in two mutually perpendicular horizontal directions {F1, F2}, and wherein the carriage {46} carries a vertical actuator {48} which supports the gripping device of the transporter {50}.

4. (Currently Amended) An apparatus as set forth in claim 1 characterised in that wherein the gripper {50} gripping device of the transporter comprises two movable jaws {52} adapted to be moved towards each other to grasp the at least one part {38} on the distributor {40} and to be moved away from each other to deposit it the at least one part in the positioning tool {64}.

5. (Currently Amended) An apparatus as set forth in claim 1 characterised in that wherein the manipulator {60} comprises an actuator {66} involving which carries and vertically displaces vertical displacement, which carries a support arm {68} that is adapted to horizontally pivot over a limited angular range of selected value, and wherein the support arm {68} supports the gripper of the manipulator {62} to permit the latter gripper of the manipulator to be displaced by a combined movement of horizontal rotation and vertical translation.

6. (Currently Amended) An apparatus for transferring at least one part to be deposited on an immobilized pallet, comprising:

Appln No. 10/072,807

Amdt date November 13, 2003

Reply to Office action of May 15, 2003

a transporter equipped with a gripping device and adapted to grasp the at least one part on a distributor, displace it from the distributor and deposit it in a positioning tool; and

a manipulator equipped with a gripper and adapted to grasp the at least one part in a precise position in the positioning tool, displace it from the positioning tool and deposit it in a precise position in a positioning receptacle carried by the immobilized pallet, wherein the manipulator comprises an actuator which carries and vertically displaces a support arm that is adapted to horizontally pivot over a limited angular range of selected value, and wherein the support arm supports the gripper of the manipulator to permit the gripper of the manipulator to be displaced by a combined movement of horizontal rotation and vertical translation |Apparatus as set forth in claim 5 characterised in that and wherein the manipulator {60} is connected to operational control means for effecting the following sequence of operations:

moving the gripper of the manipulator {62} above the positioning tool; {54},

actuating the gripper of the manipulator {62} to pick up the at least one part {38} in said positioning tool; {54},

pivoting the support arm {68} over said angular range; -

displacing the support arm {68} vertically without a change to its angular orientation to move the gripper of the manipulator {62} above the positioning receptacle {64} carried by the immobilized pallet; -

actuating the gripper of the manipulator {62} to deposit the at least one part in said positioning receptacle; {64} and

Appln No. 10/072,807

Amdt date November 13, 2003

Reply to Office action of May 15, 2003

moving the gripper again above the positioning tool {54} for a fresh sequence of operations.

7. (Currently Amended) Apparatus as set forth in claim 5 or 6 characterised in that wherein said limited angular range corresponds to is approximately 180°.

8. (Currently Amended) Apparatus as set forth in claim 5 characterised in that wherein the gripper of the manipulator {62} comprises two movable jaws {70} adapted to be moved towards each other to grasp the at least one part {38} in the positioning tool {54} and to be moved away from each other to deposit it the at least one part in the positioning receptacle {64} carried by the immobilized pallet {12}.

9. (Currently Amended) Apparatus as set forth in claim 5 characterised in that further comprising it comprises centering means {72, 76, 82} adapted to effect precise mutual positioning of the gripper of the manipulator {62} on the one hand with both the positioning tool {54} and on the other hand with the positioning receptacle {64} carried by the immobilized pallet.

10. (Currently Amended) Apparatus as set forth in claim 9 characterised in that wherein the centering means comprise comprises at least two male centering rods {72} carried by the gripper of the manipulator {62} and adapted to engage either into corresponding holes {76} in the positioning tool {54} or

Appln No. 10/072,807

Amdt date November 13, 2003

Reply to Office action of May 15, 2003

into corresponding holes ~~(82)~~ in the positioning receptacle ~~(64)~~ carried by the immobilized pallet.

11. (Currently Amended) Apparatus as set forth in claim 10
~~characterised in that~~ wherein the positioning tool ~~(54)~~ is mounted floatingly on a fixed support ~~(56)~~ by way of elastic means ~~(78)~~.

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12. (Currently Amended) Apparatus as set forth in claim 10
~~characterised in that~~ wherein the positioning receptacle ~~(64)~~ is mounted floatingly on the pallet ~~(12)~~ by way of elastic means ~~(84)~~.

13. (Currently Amended) Apparatus as set forth in claim 11 or 12 ~~characterised in that~~ wherein the elastic means ~~(78, 84)~~ comprise elastic washers or legs.

14. (Currently Amended) An installation for the circulation of part-carrying pallets comprising ~~characterised in that~~ it comprises a transfer apparatus ~~(14)~~ according to claim 1 arranged to deposit a part ~~(38)~~ on a pallet ~~(12)~~ immobilised at the location of a station ~~(36)~~ of the installation.

15. (New) An apparatus for transferring at least one part to be deposited on an immobilized pallet, comprising:

a transporter equipped with a gripping device and adapted to grasp the at least one part on a distributor, displace it from the distributor and deposit it in a positioning tool; and

Appln No. 10/072,807

Amdt date November 13, 2003 /

Reply to Office action of May 15, 2003

a manipulator equipped with a gripper and adapted to grasp the at least one part in a precise position in the positioning tool, displace it from the positioning tool and deposit it in a precise position in a positioning receptacle carried by the immobilized pallet, wherein the manipulator is connected to operational control means for effecting:

moving the gripper of the manipulator above the positioning tool;

actuating the gripper of the manipulator to pick up the at least one part in said positioning tool;

horizontally pivoting the support arm over a limited angular range;

displacing the support arm vertically without a change to its angular orientation to move the gripper of the manipulator above the positioning receptacle carried by the immobilized pallet;

actuating the gripper of the manipulator to deposit the at least one part in said positioning receptacle; and

moving the gripper again above the positioning tool for a fresh sequence of operations.